is interesting. You have seen that the ordinary zinc surface which has been exposed to air and moisture is quite inactive, but if a bright piece of zinc be immersed in water for about twelve hours, the surface is acted on; oxide of zinc is formed, showing generally a curious pattern. Now, if the plate be dried, it will be found that this oxide is strongly active, and gives a good picture of the markings on the zinc. The oxide evidently holds, feebly combined or entangled in it, a considerable quantity of the hydrogen peroxide, and it requires long drying or heating to a high temperature to get rid of it. Also, if a zinc plate be attacked by the hydrogen peroxide, the attacked parts become more active than the bright metal. Thus, place a stencil on a piece of bright zinc, and expose the plate to the action of an active plaster of Paris slab, or to active blotting-paper for a short time, then, on removing the stencil, the zinc plate will give a very good picture of the stencil. Any inactive body—for instance, a piece of Bristol board or any ordinary soft paper—can be made active by exposing it above a solution of peroxide, or, more slowly, by exposing it to a bright zinc surface. If, for instance, a copper stencil be laid on a piece of Bristol board, and a slab of active plaster of Paris be placed on the stencil for a short time, the Bristol board will even, after it has been removed from the stencil for some time, give a good picture of the stencil. Drying oil and other organic bodies may be used in the same way to change the paper. A curious case of this occurred in printing a coloured advertisement cut out of a magazine, for there appeared printing in the picture which was not in the original. This printing was ultimately traced to an advertisement on the opposite page, which had been in contact with the one which was used; thus this ghostly effect was produced.

I believe, then, that it is this active body, hydrogen peroxide, which enables us to produce pictures on a photographic plate in the dark. There are many other curious and interesting effects which it can produce, and which I should like to have shown you, had time permitted.

I would only add that this investigation has been carried on in the Davy-Faraday laboratory of this institution.

WILLIAM J. RUSSELL.

THE ROYAL SOCIETY'S CONVERSAZIONE.

THE second of the two annual conversazioni of the Royal Society was held on Wednesday, June 21, and was attended by a large and brilliant company. Many of the objects of scientific interest exhibited in the various rooms of the Society were the same as were shown at the first (or gentlemen's) conversazione held on May 3, the most important of which were described in NATURE of May 11 (p. 44). In addition to the objects already referred to, the following were among the exhibits.

Mr. C. V. Boys, F.R.S., exhibited for Mr. R. W. Wood, of the University of Wisconsin:—(1) Silvered photographic grating. The grating of 2,000 lines to the inch is a contact print on albumen. It is then silvered and polished while wet. The brilliancy of the spectrum is very great. (2) Diffraction colour photograph (see p. 199). Mr. J. E. Petavel exhibited the molten platinum standard of light.

Mr. W. A. Shenstone, F.R.S., and Mr. W. T. Evans showed experiments on the making of tubes from rock crystal in the oxyhydrogen blowpipe flame.

The Parsons Marine Steam Turbine Co., Ltd., had on view: (1) model of the *Turbinia*, the first vessel propelled by steam turbine engines; (2) model of torpedo boat destroyer of 35 knots guaranteed speed and 10,000 I.H.P.; (3) model of Atlantic liner of 38,000 I.H.P. and 27 knots speed.

Mr. A. A. Campbell Swinton showed experiments with electrolytic contact breakers. Mr. J. W. Swan, F.R.S., exhibited experiments showing effects produced by the action of modifications of the Wehnelt-Caldwell interrupter. Mr. W. R. Pidgeon showed a new influence machine. Mr. Mackenzie Davidson exhibited an apparatus to enable Röntgen ray shadows upon a fluorescent screen to be seen in stereoscopic relief.

Prof. Ray Lankester, F.R.S., exhibited (1) collections of mosquitoes recently received at the Natural History Museum for study in reference to the connection of malaria with mosquitoes; (2) drawings of mosquitoes, by Mr. Ernest E. Austen.

Dr. Patrick Manson showed microscopic specimens showing the development of the parasite of malaria.

Dr. Allan Macfadyen, for the Jenner Institute of Preventive Medicine, exhibited cultures and microscopical specimens of certain pathogenic bacteria.

Dr. Gladstone, F.R.S., showed ancient metals from Egypt, Babylon, and Britain.

The Victoria and Albert Museum for the Seismological Committee of the British Association exhibited a Milne horizontal-pendulum seismograph, with specimen of the seismograms yielded by it.

Prof. Haddon, F.R.S., showed a small collection of polished stone implements from the Baram District, Sarawak, Borneo.

Prof. T. G. Bonney, F.R.S., exhibited diamonds in eclogite. Boulders of eclogite, &c., occur in the "Blue Ground" at the Newlands Diamond Mines, West Griqua Land. Two of these contain diamonds. Thus the diamond cannot have its genesis in the "Blue Ground," nor can the latter, containing true boulders, be an igneous rock.

Mr. Walter Gardiner, F.R.S., and Mr. A. W. Hill showed histological preparations of plant tissues demonstrating the "connecting threads" which traverse the cell walls and establish a means of communication between the several cells.

Dr. F. W. Oliver exhibited a collection of Cingalese Podostemaceæ. The specimens included the majority of the Cingalese representatives of this remarkable family of flowering plants.

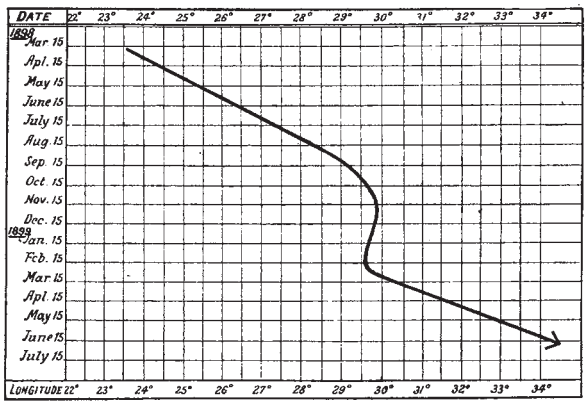
THE RED SPOT ON JUPITER.

I HAVE frequently observed this object during the present apparition of the planet, but always found it exceedingly faint and only visible under good definition. Its aspect is that of a faint dusky stain attached to the northern side of the south temperate belt, and partially filling up the hollow formed in the great southern equatorial belt. With my 10-inch reflector—power 312—the following estimated times of transit were obtained, and I have added the corresponding longitude of the object:—

Date.	Transit time.	Long.
	h. m.	°
1898 November 29 ...	19 55 ...	31·9
1899 February 2 ...	18 39 ...	29·5
7 ...	17 46 ...	29·0
24 ...	16 49 ...	30·0
26 ...	18 27 ...	29·9
April 19 ...	11 20 ...	32·0
26 ...	12 3 ...	30·8
May 6 ...	10 19 ...	31·7
8 ...	11 58 ...	32·3
June 4 ...	9 18 ...	34·4
6 ...	10 57 ...	34·8
9 ...	8 26 ...	34·4
11 ...	10 4 ...	34·0
14 ...	7 32 ...	32·9
16 ...	9 13 ...	34·4
21 ...	8 20 ...	33·5
23 ...	9 58 ...	33·1
26 ...	7 29 ...	33·7

This feature has shown a remarkable variation of motion during the last twelve months. In the winter there was a very decided acceleration of speed, but during the past three months the motion has been again retarded. The acceleration was first noticed here on the morning of February 3, when the marking came to the central meridian seven or eight minutes before its computed time. In the first half of 1898, and again during the last few months, the rotation period of the spot was nearly 9h. 55m. 42s., but for several months in the past winter the rate corresponded very nearly with 9h. 55m. 40·6s., the period employed by Mr. Crommelin in System II. of his ephemerides (*Monthly Notices*, November 1898). But, unfortunately, the precise character of the recent irregularity of motion cannot be determined, Jupiter having been too near the sun for effective observation during several months (August to November 1898).

The following diagram will, however, represent approximately the variation, which amounted to nearly one and a half seconds. in the rotation period :—



My observation of 1898 November 29 was probably not very accurate, as the planet was low and very faint in the fog which prevailed. It is, however, in part confirmed by an observation obtained by Prof. G. W. Hough in 1898 December 10, who found the spot in the computed position, and saw no indication of the accelerated rate, which soon afterwards began to operate. In preparing the diagram I have, however, preferred to think that my autumn observation was a little late, as this requires a less sudden and extreme variation in the motion of the spot. This object should be carefully watched until the close of the present opposition, and the times of its transit secured on all possible occasions. There will be little difficulty in continuing observations until the end of August. If the red spot itself is not sufficiently distinct to be well observed when presented on the central meridian, transits of the middle of the hollow or bay in the southern side of the south equatorial belt will answer the purpose equally well.

Since the spot became a very prominent feature in 1878 it has exhibited an increasing rate of rotation, the period rising from 9h. 55m. 37s. to 9h. 55m. 42s. This increase has not been perfectly regular, for the motion has shown many irregularities similar to that which affected it during the past winter. No doubt the time will come when the maximum rate will be reached, to be followed thereafter by a marked shortening of the period. This appears to have been the case in 1859, and there is indication that the cycle of variations extends over a period of about 48½ years; if so, we cannot expect a decided acceleration in the mean rate of the spot until the year 1907 or 1908.

There is every prospect that in a few years we shall be much better acquainted with the surface phenomena of Jupiter, and the variations affecting them, than we are at the present time. A very large number of useful observations were obtained in 1898, and many more are being secured during the present year. Observers are now generally recognising the necessity of accumulating observations of all the visible details of the surface, and determining the velocities of the various and varying currents in which they are situated.

The planet has recently afforded a singularly abundant display of spots and irregularities. Dark and white masses of material are thickly arranged near the equator, and from a partial investigation these appear to be moving rather slower than in 1898, the rate being now 9h. 50m. 25s., as against 9h. 50m. 23½s. during the previous opposition. A considerable number of white and dark spots are also distributed along the northern edge of the northern equatorial belt, which give a period slightly less than that of the red spot, but some of these markings are moving much more rapidly than others. The quickest of all is a small dark spot now in long. 145°, which has given a period of 9h. 55m. 15s., or about 27 seconds less than that of the red spot. In other latitudes a vast amount of detail is exhibited, and it is fortunate that the planet is being so sedulously studied by Mr. A. S. Williams, Prof. Hough, Mr. Gledhill, the Rev. T. E. R. Phillips, Captain Molesworth, and other able observers. W. F. DENNING.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Harkness Studentship in Geology has been awarded to Mr. A. L. Hall, Caius, first class in Natural Science Tripos, Part II., 1899.

The following College awards in Natural Science are announced :—

Clare : Scholarships to Cassidy, Goodchild, and F. G. Smith ; Exhibition to H. B. Jackson.

Trinity Hall : Scholarship to H. S. Newbould.

King's : Scholarship to Barger ; Exhibitions to Kewley, Mollison, Matthews, and Cartwright.

Emmanuel : Exhibitions to Walker, Heaton, Nixon, Sutton, Austin.

Mr. G. T. Bennett (Senior Wrangler 1890) has been elected a Senior Fellow, and Mr. H. S. Carslaw (Fourth Wrangler 1894) a Junior Fellow, at Emmanuel College.

At the beginning of the Michaelmas term, the General Board will proceed to elect a University Lecturer in Physical Anthropology for five years, with a stipend of 50*l.* a year. Names must be sent in to the Vice-Chancellor by September 30.

At Caius College, E. P. Widdicombe (Downing) and H. E. Wimperis have been elected to Salomons Engineering Scholarships, and R. H. Yapp (St. John's) to a Frank Smart Studentship for Botany.

At Christ's College, Scholarships for Natural Science have been awarded or continued to Hocking, Howlett, Brown, Gottschalk, Leake, Hoffmann, Fox, Muff, and Cumberlidge.

At Sidney Sussex College, Science Scholarships have been awarded to Bullough, Coales, Colt, Fearnsides, Fyson, and Stenhouse.

SIR W. T. THISELTON-DYER, K.C.M.G., F.R.S., has been elected to an honorary studentship at Christ Church, Oxford.

DR. MAGNUS MACLEAN has been elected Professor of Electrical Engineering in the Glasgow and West of Scotland Technical College.

PROF. FRED W. MCNAIR has been elected president of the Michigan College of Mines. Prof. McNair has been for some years in charge of the department of mathematics and physics.

PROF. A. R. FORSYTH, F.R.S., Sadlerian professor of pure mathematics in the University of Cambridge, has had the honorary degree of LL.D. conferred upon him by the University of Dublin.

THE London School of Economics and Political Science, 10 Adelphi Terrace, W.C., offers the following research studentships, which will be awarded on examination in July : (1) One of 100*l.* a year, for two years, presented by the Hon. Bertrand Russell, Fellow of Trinity College, Cambridge. (2) One of 50*l.* a year, for two years. (3) The "Lucy Rose" studentship of 50*l.* a year, for two years, presented by Mr. Edward Rose—open to women students only. Preference will be given to a woman student sprung from the working classes. The studentships are intended to enable students to become trained investigators, and to promote the execution of definite pieces of original work relating either to past or present economic or political conditions.

THE *Times* states that the Association of Directors and Organising Secretaries for Technical and Secondary Education have addressed a memorial to the Government with regard to the alteration made in the Board of Education Bill in the Standing Committee of the House of Lords at the instance of Lord Spencer. The association entreat the Government to induce the House of Commons to restore Clause 3 (1) to its original shape, on the ground that the term "school supplying secondary education" (used in that clause) is a very wide one, and, if interpreted in the light of the report of the Royal Commission on Secondary Education, must include polytechnics, higher grade schools, science schools, art schools, commercial schools, and agricultural schools. These, it is submitted, are the very types of schools which are being founded or developed all over the kingdom by the county councils, which supply the pressing industrial needs of the day, and demand that guidance and encouragement which it is the object of the Bill to supply.

THE second reading of the Board of Education Bill was agreed to by the House of Commons on Monday. Sir John Gorst, in moving the second reading, explained that the object of the Bill is to enable the Government to create a department